

REMARKS

The final Official Action rejected Claims 1 – 10, 12 – 14, 16 – 29 and 31 under 35 U.S.C. § 103(a) as being obvious in light of U.S. Patent No. 5,892,462 to My Tran in view of U.S. Patent No. 4,645,459 to Carl P. Graf, et al. Dependent Claims 11, 15 and 30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Tran ‘462 patent and the Graf ‘459 patent, in further view of U.S. Patent No. 4,985,854 to Timothy M. Wittenburg, in conjunction to Claim 11 and in view of U.S. Patent No. 5,381,338 to David A. Wysocki, et al. in conjunction with Claims 15 and 30. Further, dependent Claims 55-58 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Tran ‘462 patent and the Graf ‘459 patent, in further view of U.S. Patent No. 6,370,539 to Richard A. Ashby, et al. As described below, independent Claims 1 and 17 have been further amended so as to be further patentably distinct from the cited references, taken either individually or in combination. Moreover, a number of the dependent claims recite additional features that are not taught or suggested by the cited references, taken either individually or in combination. As such, Applicant respectfully requests reconsideration of the application and allowance of the claims.

As set forth by independent Claims 1 and 17, an apparatus and method, respectively, are provided for automatically generating a terrain model for display during a simulated flight. Initially, the area containing the mission route for which terrain source data is required is determined. A plurality of predefined electronic collections of terrain source data are then automatically searched to identify terrain source data covering the area containing the mission route. The terrain source data is subsequently processed into one or more predefined formats and is then automatically compiled to create a terrain model for display during flight simulation.

Independent Claims 1 and 17 each further define the manner in which the plurality of predetermined electronic collections of terrain source data are searched. By way of example, independent method Claim 17 recites that terrain source data is identified from at least two alternative predefined electronic collections of terrain source data that each represent a common region of the area containing the mission route and that the terrain source data from which the terrain model is subsequently constructed is selected from only one of the alternative predefined

electronic collections of terrain source data to represent the common region of the area containing the mission route. Independent apparatus Claim 1 further defines the search engine in an analogous manner to be capable of performing these same functions as described above in conjunction with independent Claim 17.

By way of further explanation, the searching of a number of different electronic collections of terrain source data, such as collections maintained by JSIPS, USIGS, MEL, the National Weather Service, USGS and commercial satellite services, advantageously permits the method and apparatus of the claimed invention to construct an accurate and up-to-date terrain model that is appropriate for the current and/or anticipated flight conditions. As described by page 13, lines 17 – 28 of the present application:

In searching the electronic collections of terrain source data, the search engine will oftentimes identify terrain source data maintained by different electronic collections that depict the same portion of the area. In these instances, the search engine reviews the terrain source data from each electronic collection and selects the terrain source data that is of the highest quality and is most recent. For example, the search engine will select a digital photograph of a portion of the area taken on a clear day in the past week instead of a digital photograph of the same portion of the area taken on an overcast day two months ago, assuming that the mission is intended to be performed on a clear day. As such, the digital photograph taken on a clear day will be more representative of the situation with which the pilot will actually be confronted during the flight.

In other words, one embodiment of the method and apparatus of independent Claims 1 and 17 identifies several different alternative collections of terrain source data that depict the same region and then selects one collection, i.e., one source, of the terrain source data for the region (typically the collection that best represents the region). The terrain source of this one collection is then processed and compiled to create that portion of the terrain model that is representative of the region.

The primary reference, i.e., the Tran '462 patent, does not teach or suggest the method and apparatus of amended independent Claims 1 and 17. In this regard, the Tran '462 patent describes a ground collision avoidance system for use during actual flight, as opposed to use in conjunction with flight simulation operations as per the claimed invention. The ground collision avoidance system of the Tran '462 patent utilizes a digital terrain elevation database to generate

a terrain model of the terrain over which the aircraft is flying. The ground collision avoidance system utilizes inputs from various onboard sensors, such as active terrain sensors and/or the radio altimeter, to update the terrain data provided by the digital terrain elevation database. Thus, any variations between the prestored terrain data and the readings obtained by the onboard sensors can be detected and the terrain data can be updated.

While the Tran '462 patent does describe the correction or updating of prestored terrain data, the final Official Action recognized that the Tran '462 patent "does not specifically disclose identifying terrain source data from at least two alternative electronic collections of terrain source data that represents a common region of an area containing the mission route", as recited by independent Claims 1 and 17. The final Official Action therefore cited the Graf '459 patent and, in particular, column 9, lines 5-15 and column 10, lines 2-30 of the Graf '459 patent for its alleged disclosure of two separate, predefined electronic collections of terrain source data covering a common region containing a mission route from which a user can select for use during simulation. As described below, however, the Graf '459 patent also fails to teach or suggest identifying terrain source data from at least two alternative predefined electronic collections of terrain source data that represents a common area containing the mission route, and thereafter selecting the terrain source data from only one of the alternative predefined electronic collections to represent the common region containing the mission route, as recited by amended independent Claims 1 and 17.

The Graf '459 patent describes a computer controlled imaging system adapted to construct a display scene from a library of images in real time or near real time. As described in columns 9 and 10, the Graf system includes a database having two areas. One portion of the database contains an object library that stores the actual imagery, such as bushes, trees, surfaces, mountains, roads or lakes, while the other portion of the database contains the reference points for locating the various objects stored by the object library in the image that is eventually constructed. Thus, the Graf '459 patent does not teach or suggest identifying two alternative predefined electronic collections of terrain source data that represent a common area, as recited by the claimed invention. Instead, the two portions of the database of the Graf system are complimentary and must both be accessed in order to obtain the imagery and to properly position

the imagery in the simulated scene. Additionally, the Graf '459 patent does not teach or suggest the selection of terrain source data from only one of the alternative predefined electronic collections, as also recited by the amended independent claims, since the Graf system requires information from both portions of the database to provide the simulated imagery.

In this regard, the comments accompanying the Advisory Action state that "Graf presents a plurality of predefined electronic collections of terrain source data each of which covers the common area of an assigned mission route, any one of which may be selected to represent a common area. In addition, a composite reference data map of the mission area composed in Graf is consistent with the functionality expressed in the instant application." In contrast to the comments accompanying the Advisory Action, however, the Graf '459 patent does not teach or suggest that any one of the electronic collections of terrain source data may be selected to represent a common area. Instead, the Graf '459 patent describes the concurrent use of all collections of terrain source data to represent a common area since the collections are complimentary and are not independent of and alternatives to one another – with one collection providing the actual imagery and the other collection containing the reference points for locating the various objects from which the imagery is constructed. Thus, both portions of the Graf database are required to construct an image while the method and apparatus of amended independent Claims 1 and 17 identifies several alternative collections of terrain source data and then selects only one of the alternatives.

The other references, that is, the Wittenburg '854 patent and Wysocki '338 patent, also fail to teach or suggest the apparatus and method of amended independent Claims 1 and 17 and, in fact, are only applied to certain dependent claims by the Official Action. In particular, the Wittenburg '854 patent and the Wysocki '338 patent similarly both fail to teach or suggest identifying terrain source data from at least two alternative predefined electronic collections of terrain source data that represents a common area containing the mission route, and thereafter selecting the terrain source data from one of the alternative predefined electronic collections to represent the common region containing the mission route, as recited by independent Claims 1 and 17.

In contrast, both secondary references describe the combination of a digitized photograph with elevation data to transform a two-dimensional photograph into a three-dimensional terrain model. Thus, while both the digitized photograph and the elevation data may represent the same region, neither the Wittenburg '854 patent nor the Wysocki '338 patent select the terrain source data from one alternate collection of terrain source data to represent the common region. In other words, neither the Wittenburg '854 nor the Wysocki '338 patent teach or suggest treating the digitized photograph and the elevation data as alternatives and selecting one of the alternative sources of terrain source data. Instead, in an analogous manner to the Graf '459 patent, the systems of the Wittenburg '854 patent and the Wysocki '338 patent are specifically designed to utilize both the digitized photograph and the elevation data to construct a terrain model.

Since none of the cited references teach or suggest the identification of terrain source data from at least two alternative predefined electronic collections of terrain source data that represents a common area containing the mission route, and thereafter the selection of the terrain source data from one of the alternative predefined electronic collections to represent the common region containing the mission route, as recited by independent Claims 1 and 17, any combination of the cited references similarly fails to teach or suggest the apparatus and method of independent Claims 1 and 17. Thus, Applicant respectfully submits that the rejection of independent Claims 1 and 17 is therefore overcome.

The dependent claims include the recitations of a respective independent claim and are therefore patentably distinct from the cited references for at least the same reasons as described above in conjunction with the respective independent claims. However, a number of the dependent claims include additional recitations that are not taught or suggested by the cited references and are therefore patentably distinct for these additional reasons.

For example, dependent Claims 3-6 and 19-22 recite that the area is automatically divided into a plurality of regions based upon the mission route and a respective resolution of the terrain source data for each region is determined. As explained by the present application, the division of the area into regions that may have different respective resolutions permit certain regions to be imaged with greater resolution, such as those regions in the vicinity of a target, while other regions are imaged with less resolution, thereby conserving memory space and

improving the speed with which the image data can be processed. In contrast, none of the cited references, including the Tran '462 patent that is cited by the final Official Action, teach or suggest the division of an area into a number of regions, each of which may have a respective resolution. Thus, dependent Claims 3-6 and 19-22 are patentably distinct from the cited references when taken either individually or in combination, for this additional reason.

In addition, dependent Claims 8 and 24 recite that terrain source data from prior mission routes is stored. Further, dependent Claims 9-11 and 25-26 build upon Claims 8 and 24, respectively, by describing the utilization of the terrain source data from prior mission routes as one of the predefined electronic collections of terrain source data from which the terrain model is constructed. The final Official Action indicates that column 5, lines 57-62 of the Tran '462 patent describes the storage of data from prior mission routes. However, the Tran '462 patent does not teach or suggest the storage of data from prior mission routes. Instead, the passage from the Tran '462 patent that was referenced by the final Official Action relates to the use of information from a variety of onboard systems, none of which are described to be providing any data from prior mission routes. Likewise none of the other cited references teach or suggest the storage of terrain source data from prior mission routes and the use of terrain source data from prior mission routes as one of the predefined electronic collections of terrain source data, as recited by dependent Claims 8-11 and 24-26. Thus, dependent Claims 8-11 and 24-26 are patentably distinct from the cited references, taken either individually or in combination, for these additional reasons.

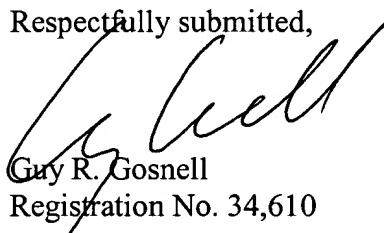
CONCLUSION

In view of the foregoing remarks, Applicant submits the rejections raised by the final Official Action have been overcome and that the application is in condition for allowance. As such, Applicant respectfully requests the issuance of a Notice of Allowance. If there remain any issues with respect to the present application, it is requested that the Examiner contact Applicant's undersigned attorney in order to expeditiously advance examination of the present application.

It is noted that an initialed copy of the PTO Form 1449 that was submitted with Applicants' Information Disclosure Statement filed March 23, 2004 has not been returned to Applicants' representative with the Office Action. Accordingly, it is requested that an initialed copy of the Form 1449 be forwarded to the undersigned with the next communication from the PTO. In order to facilitate review of the references by the Examiner, a copy of the Information Disclosure Statement and the Form 1449 are attached hereto. Copies of the cited references were provided at the time of filing the original Information Disclosure Statement, and, therefore, no additional copies of the references are submitted herewith. Applicants will be pleased to provide additional copies of the references upon the Examiner's request if it proves difficult to locate the original references.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

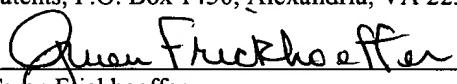


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